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Disease-Resistant  
Varieties of  
*Vegetables*  
for the  
Home Garden

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# DISEASE-RESISTANT VARIETIES OF VEGETABLES FOR THE HOME GARDEN

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Home vegetable gardens, which add so much to better family living, would usually be easier to maintain if it were not for the ravages of plant diseases and insect pests. Ways are available to wage a successful fight against these enemies, however, and those who understand and follow such practices are the ones that are most successful. A large part of the success in controlling vegetable diseases lies in early precautions.

In choosing varieties of vegetables to plant it is well to select those that are resistant to prevailing diseases, if available.

Also, it is important to start with disease-free seed, as many diseases are seed borne. This means obtaining good, high-quality seed that has been grown under sanitary conditions, from a reliable, well-established seed company.

A third precaution to take against disease is to treat or disinfect some kinds of seed with a good seed-treating material before planting. Instructions for doing this may be obtained from your State agricultural college.

Other early precautionary measures include rotation of the garden plot from one location to another to keep down soil infestation with plant-disease-producing organisms, the use of new, clean soil in seed flats and beds, and avoiding the use of infested compost. After the plants are up, it is sometimes necessary to spray or dust them for leaf diseases.

Ways of preventing vegetable diseases by using some of these methods are described in United States Department of Agriculture Farmers' Bulletin 1371, "Diseases and Insects of Garden Vegetables."

This leaflet briefly describes some of the diseases which have caused heavy losses and gives the names of and a few facts about varieties resistant to these diseases. The list is rather short, but the United States Department of Agriculture, the State agricultural experiment stations, seedsmen, and many private individuals at present are active in developing more and better disease-resistant varieties.

## Asparagus

Rust at one time almost ruined the asparagus-growing industry of the United States. However, owing to the prompt development of resistant varieties of asparagus, the disease was overcome so that today it is not of much importance.

Rust is not a disease of the edible, young shoots but of the mature tops, attacking them in the summer and devitalizing them, and con-

sequently the roots. Small pustules are formed on the stems, twigs, and leaves that are at first reddish and later turn black. The tops of the plants take on a yellow color and look as if they were ripening prematurely.

Mary Washington and also Martha Washington and other strains of the Washington type are highly resistant to rust and are good commercial varieties. Mary Washington is the most popular variety grown and is carried by practically all seed firms having asparagus seed or roots for sale. It is a cross between Mary, a giant female seedling selected from a bed of Reading Giant from England, and Washington (male). The cross was made by J. B. Norton at Concord, Mass., in 1910. Superior strains of Mary Washington have been selected and given other names by certain seedsmen.

### Bean

Common bean mosaic causes the leaves to be mottled with light-green and dark-green areas. Because of uneven growth, affected leaves may be puckered, cupped, and dwarfed. Badly affected plants are stunted and fail to bear a profitable crop. Usually mosaic comes into the home garden with the seed. It is spread in seed fields largely by sucking insects. Some varieties are much more susceptible than others.

Anthrachnose is a seed-borne bean disease that is not so serious as it used to be, because most bean seed now is grown in the far West, where dry climate during the growing season prevents its development. It is characterized by dark, sunken, circular cankers on the pods and blighting of the leaves.

The bacterial blights are caused by seed-borne bacteria. They cause a blighting of the leaves and spotting of the pods. As with anthrachnose, the best way to avoid injury is to use disease-free seed. There are considerable differences in susceptibility of varieties, but as yet none have been produced that are very resistant. Robust Pea, Yellow Eye, Marrow, and beans of the Refugee type are resistant enough so that they can usually be successfully grown.

Rust occurs widely over the United States. It causes small, reddish-brown pustules on the leaves and sometimes on stems and pods. Affected leaves turn yellow and drop off. There are several forms or types of this rust.

Curly top occurs in the Rocky Mountain States and westward. It also affects sugar beets, tomatoes, squash, and many other vegetables. Bean plants are stunted and killed.

### Green Snap Beans

Refugee U. S. No. 5, Idaho Refugee, Wisconsin Refugee, Sensation Refugee Nos. 1066 and 1071, and Medal Refugee are all resistant to common bean mosaic, to which snap beans of the Refugee type are generally susceptible. The first three are also resistant to powdery mildew. The Idaho Refugee and the Wisconsin Refugee varieties are further resistant to some strains of the anthrachnose fungus and tolerant to the bacterial blights.

### Pole Beans

Kentucky Wonder U. S. Nos. 3 and 4 are two selections from European pole beans of the Kentucky Wonder type that are resistant to some forms of rust. Some of the seed companies also have other

selections of Kentucky Wonder that are more rust tolerant than the ordinary variety.

Alabama No. 1 is a pole bean selected from a strain that has long been grown in Alabama. It is said to be tolerant to the root knot nematode that is serious in sandy soils of the Southern States.

#### Shell Beans (dry edible)

Great Northern U. I. Nos. 59, 81, and 123 are three improved selections of shell beans made by the University of Idaho from the variety Great Northern. They are highly resistant to common bean mosaic and tolerant to yellow bean mosaic.

Wells Red Kidney, Geneva, and York are three red kidney beans that have been developed at the New York Agricultural Experiment Station for their resistance to anthracnose. Most of the red kidney-bean seed on the market is one of, or a combination of, these varieties.

Perry Marrow, Jumbo Marrow, Castile Marrow, and Nova Scotia Marrow are beans of the Marrow type resistant to anthracnose.

Geneva Pea, Honeoye Pea are resistant to anthracnose.

Robust Pea is resistant to common bean mosaic and anthracnose and usually is resistant enough to the bacterial blights to make a successful crop. Pinto, Colorado strain, is very tolerant to blight.

Red Mexican, California Red, California Pink, Burtner, Red Mexican U. I. Nos. 3 and 34, and Great Northern U. I. No. 15 are shell beans adapted to the West that are resistant to curly top except when very young. The last three are also resistant to common bean mosaic.

#### Lima Bean

Hopi 5989, Hopi 12, and Hopi 13 show resistance to the root knot nematode in California. They are also resistant to heat and drought and common root rots. No. 5989 is a pole bean and Nos. 12 and 13 are semi-erect types.

#### Cabbage

Yellows, or fusarium wilt, attacks cabbage severely and sometimes affects kale and other plants of the cabbage family when planted on infested land. Affected plants become stunted, turn yellow, and drop their leaves, from the ground up. When cut open, the stems show a brown discoloration of the woody tissue. This disease is caused by a fungus that lives in the soil; once established in a garden or field, it may remain for many years.

Fortunately, excellent varieties of various types of cabbage that are yellows resistant are available. Most of these were originated at the Wisconsin Agricultural Experiment Station in cooperation with the United States Department of Agriculture. The varieties with the approximate length of time required to reach maturity are:

Jersey Queen. Jersey Wakefield type, 60 days.

Racine Market. Early Copenhagen Market type, 60 days.

Marion Market. Copenhagen Market type, 70 days.

Globe. Glory of Enkhuizen type, 75 days.

Wisconsin Allhead Select. Allhead Early type, 75 days.

Wisconsin All Seasons. All Seasons type, 90 days.

Wisconsin Ballhead. Danish Ballhead type, 95 days.

Wisconsin Golden Acre. Golden Acre type, 65 days.

Wisconsin Hollander No. 8. Hollander type, 100 days.

Red Hollander. Hollander type, 100 days.



### Celery

Yellows is a disease that is more likely to be troublesome in commercial celery areas, where the crop is grown frequently on the same ground, rather than in home gardens that are rotated occasionally. Affected plants are stunted and yellowed and have a yellowish or reddish discoloration in the woody part of the stalks near the crown. Giant Pascal and other dark-green varieties are very resistant; but easily blanching celeries are liable to fail if planted on "yellows" soil, that is, soil infested with the fungus that causes the disease.

Michigan Golden, developed by the Michigan Agricultural Experiment Station, is resistant to yellows. It is like Golden Self Blanching in type. The seed is produced, packeted, and sealed under supervision of the Michigan State College of Agriculture and Applied Science.

Golden Pascal and Florida Golden are other new white varieties that show resistance. Cornell No. 19 is also resistant and combines the high quality of Pascal with the desirable color and easy blanching of Golden Self-Blanching.

### Cucumber

Mosaic causes mottled, wrinkled, dwarfed leaves; mottled, warty fruit; and stunted plants. It is caused by a virus that lives overwinter in the roots of certain wild perennial plants, such as wild cucumber, milkweed, catnip, pokeberry, and groundcherry.

Shamrock, a large slicing cucumber suitable for the home garden, is resistant to mosaic. It is like White Spine in type.

### Lettuce

Brown blight is a disease that has threatened lettuce growing in the Southwest, particularly California and Arizona. Affected plants become stunted, yellow, and gradually turn brown and die. It is apparently a soil-borne disease. Once a field becomes infested, it stays so for many years, and lettuce cannot be grown unless resistant varieties are used.

Downy mildew causes spots on the leaves, at first light green, then yellow, and finally brown. The white mildew grows on the under side of the spot.

Tipburn is one of the most destructive diseases of head lettuce. It is associated with high temperatures. It is not likely to be severe on the early-spring or late-fall crops. The edges of the leaves turn brown, and growth is slowed down. Leaves inside the head may become slimy.

Varieties of lettuce have been developed by the Bureau of Plant Industry that are resistant to both brown blight and downy mildew.

Imperial Nos. 847, 44, 152, and 615 are resistant to brown blight. They are like New York in type.

Imperial C, D, and F and other lettered varieties of Imperial are resistant to both brown blight and downy mildew.

Cosberg and Great Lakes are two new varieties that are resistant to tipburn.

### Muskmelon

Powdery mildew affects melons, cucumbers, and other related plants. It appears as a white, mealy growth in spots on the upper

surface of the leaves. When there is a severe attack of the disease, the leaves wither and die. It is most serious in irrigated sections of the West. There are at least two forms of the fungus that cause this very destructive disease.

Powdery Mildew Resistant Cantaloup No. 45 was developed in California from a cross between Hales Best and a melon from India. It is of the Hales Best type, of excellent quality, and a good shipper. It is resistant to form No. 1 of the mildew but susceptible to form No. 2, which was serious in 1939.

Golden Gopher is a muskmelon highly resistant to fusarium wilt in Minnesota.

### Peas

Wilt-resistant strains of a large number of the more important pea varieties have been developed in the past 15 years for both canning and market purposes. The wilt-resistant strains are identical with the parent strains bearing the same names, except for the factor of resistance to wilt. Most of these have been developed by private seed companies. Among them are: Alaska, Alderman (Dark Podded Telephone), Dwarf Telephone (Daisy), Gilbo Improved Stratagem, Morse Market, Perfection, Surprise.

### Potato

Mild mosaic causes a slight crinkling, dark- and light-green mottling of leaves, a reduction in vigor of the plant, and a lowering in yield. It is one of the principal causes of so-called "running-out." It is caused by an insect-transmitted virus.

Late-blight and the tuber rot that accompanies it are often very destructive in moist climates, blighting the tops and rotting the tubers.

Katahdin, Chippewa, Golden, and Houma are four new varieties originated by the United States Department of Agriculture that are resistant to mild mosaic. The first two varieties are smooth, uniformly shaped, midseason, good-yielding, and widely adapted. Golden is a yellow-fleshed variety of good quality but limited adaptation. Houma has proved to be well adapted to parts of Louisiana.

Sebago is a new variety, recently released by the United States Department of Agriculture, that is resistant to late-blight of the vines and tubers. In gardens along the Atlantic seaboard and in the Northeastern and Lake States, where late-blight is often damaging, this variety can be grown successfully even without spraying with bordeaux mixture. It is also resistant to mild mosaic.

### Pumpkin

Curly top affects pumpkins as well as sugar beets, beans, and certain other vegetable crops in the Rocky Mountain States and westward to the extent that these vegetables frequently cannot be grown unless resistant varieties are planted.

Varieties of the Cheese group, Cushaw group, and Tennessee Sweetpotato group, and Big Tom are resistant to curly top.

Early Cheyenne is a new pumpkin of the New England pie type that is resistant to some of the diseases that commonly occur in irrigated sections of the West.



### Spinach

Mosaic, blight or yellows, is somewhat like mosaic diseases of other plants in appearance. It causes a mottling and curling of the leaves, which may later become yellow and die. It is caused by a virus and is spread by aphids.

Virginia Savoy and Old Dominion, both originated at the Virginia Truck Experiment Station, Norfolk, Va., are resistant to mosaic and of good commercial quality. Virginia Savoy goes to seed very quickly when sown in the spring and, therefore, should be grown only as a fall crop.

### Sweet Corn

Bacterial wilt causes diseased streaks in the leaves of sweet corn, which finally die. Affected plants produce few or no ears, depending on the earliness of the disease attack. Yellow early varieties are much more susceptible than the white, late ones. Several early, yellow hybrid sweet corns that show resistance are now on the market. When selecting early yellow varieties for the home garden, select one that is listed as resistant to wilt.

Golden Cross Bantam, developed at the Indiana Experiment Station in cooperation with the United States Department of Agriculture, is an excellent standard, midseason, yellow, wilt-resistant variety. Several lines of Marcross, Spancross, Whipcross, and others developed by the Connecticut Agricultural Experiment Station are also resistant to bacterial wilt. Several other varieties with some degree of resistance are listed by seedsmen.

### Squash

The Marblehead, the Long White Bush, and the Vegetable Marrow varieties of squash are resistant to curly top. See Pumpkin (p. 6).

### Tomato

Fusarium wilt is very common in all but the more northern States. It is caused by a fungus that enters the roots from infested soil, grows into the water vessels, and causes the leaves to roll, become yellow, and finally die. When affected plants are cut open, the woody part of the stem is found to be darkened.

Verticillium wilt is much like fusarium wilt in its appearance but much less common.

Nailhead spot is caused by a fungus that makes round, sunken spots on fruits and brown spots on stems and leaves. It is found chiefly in the South.

Marglobe, Pritchard (Scarlet Topper), and Glovel are all resistant to fusarium wilt and to nailhead spot. Certified seed is more likely to be satisfactory than noncertified.

Louisiana Pink and Louisiana Red are two varieties resistant to fusarium wilt adapted to conditions in Louisiana and surrounding States.

Riverside and Essar are resistant to fusarium wilt and verticillium wilt. They were developed in California by the United States Department of Agriculture in cooperation with the California Agricultural Experiment Station. They are adapted only to the West.

Prairiana, Early Baltimore, Illinois Pride, and Illinois Baltimore are four field varieties said to be resistant to fusarium wilt and adapted in Illinois. They were developed by the Illinois Agricultural Experiment Station.

Pan America, recently developed by the United States Department of Agriculture, is practically immune to fusarium wilt.

Rutgers, developed by the New Jersey Agricultural Experiment Station, is wilt resistant, productive, and widely adapted in the Eastern and Southeastern States.

### Watermelon

Fusarium wilt is a very common disease of watermelons. It is caused by a fungus that, once established in the soil, is very difficult to get rid of. Many thousands of acres of watermelon land have been abandoned because of wilt-sick soil. Affected plants wilt and die early.

Resistant varieties such as the following offer the best solution of the wilt problem:

Hawkesbury (Hawkesbury Wilt Resistant) is a dark-seeded, long, gray-skinned melon introduced from Australia.

Improved Kleckley Sweet No. 6 is a selection from Kleckley Sweet made by the Iowa Agricultural Experiment Station.

Improved Stone Mountain No. 5 was developed from a cross of Stone Mountain with a Japanese variety by the Iowa Agricultural Experiment Station.

Leesburg is a resistant selection from Kleckley Sweet made by the Florida Agricultural Experiment Station.

Klondike R7 was developed from a cross between Klondike and Iowa Belle (resistant) made in California.